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(54) PREPARATION OF  
SILICON NITRIDE

(57) Abstract:

PURPOSE: To prepare high-purity silicon nitride, by bringing a reactive gas flow containing a silicon hydride compound and a specific amount of ammonia into contact with plasma flow, keeping a volume ratio of the reactive gas to the plasma gas calculated at normal temperature and normal pressure in a specific range.

CONSTITUTION: A reactive gas flow

containing one or more silicon hydride compounds of monosilane, disilane, trisilane, and tetrasilane, and ammonia in an amount of give 2W200 times moles (especially 10W100 times moles) of Si in the silicon hydride compounds, and, if necessary, a carrier gas is introduced into a plasma furnace. A plasma flow obtained by the radiofrequency induction heating of one or more of argon, hydrogen, and ammonia is previously formed in the plasma furnace. The reactive gas is brought into contact with the plasma flow while a volume ratio of the reactive gas to the plasma gas is kept in a range of 0.5W20 (especially 1W10).

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